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AUTHOR Horn, B. Ray
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ABSTRACT

The need for environmental education programs for citizen groups and schools alike is defined, together with the need to plan for such education. To bring about this process a state plan for environmental education is advocated. Such a plan is viewed as a four-part, comprehensive and long-range chart for planned change. To function effectively, the plan should include a statement of the authors' beliefs, assess current efforts and define goals, develop the means for arriving at the goals, and design evaluative systems. The development of Michigan's plan for environmental education is discussed at length indicating its essential elements and key recommendations. The role of government and institutional priorities are also assessed. An extensive bibliography is appended. (BL)

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LONG-RANGE EDUCATIONAL PLANNING AND THE ENVIRONMENT: A RATIONALE FOR A STATE ENVIRONMENTAL EDUCATION PLAN IN MICHIGAN

by

B. Ray Horn
Planning Coordinator/Executive Director
Governor's Task Force on Environmental Education
Executive Office of the Governor
State of Michigan

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At exactly 5:13 a.m., the 18th of April, 1906, observes Don Fabun, "a cow was standing at 123° . . . West longitude, 37° . . . North latitude--somewhere between the main barn and the milking shed on the old Shafter Ranch in California, minding her own business. Suddenly, the earth shook, the skies trembled, and when it was all over, there was nothing showing of the cow above ground but a bit of her tail sticking up. For the student of change, the Shafter cow is a sort of symbol of our times. She stood quietly enough, thinking such gentle thoughts as cows are likely to have, while huge forces outside her ken built up all around her and--within a minute--discharged it all at once in a great movement that changed the configuration of the earth, and destr yed a city, and swallowed her up. And that's what we are going to talk about now; how, if we do not learn to understand and guide the great forces of change at work on our world today, we may find ourselves like the Shafter cow. swallowed up by vast [problems] . . . quite early some morning."[1]

CHANGE--THE CONTEXT OF EE

The rate of change is so malignant that its conceptualization is mind boggling. I give you the following quantity of examples, not to over emphasize my point, but to give you a here and now feeling of how we tend to react when confronted with the storm and complexity of the challenges prodding us:

> FACT: "A 'laser-listener' can convert an ordinary window into a microphone whose messages can be picked up as far as the window can be seen. Sound waves inside a room produce minute vibrations in window-glass. If a beam of very pure light from a laser is reflected from the window, which can be done easily without anyone inside the room knowing, it will pick up the vibrations. A receiver turns the vibrations back into speech"[2] Undetectable eavesdropping is here.
>
> FACT: A new "nickel-titanium alloy can be fashioned into a complex shape at a high temperature, then cooled and crushed beyond recognition. But it magically regains its original shape when it is reheated. 'remembering' every curve and angle. A radiotelescope as large as a mile in diameter could be compactly packaged on the ground and sent into space to unfold when solar-heated."[3]
>
> FACT: "Life Magazine estimates that the average college student sees 20 movies to every book he reads."[4] It has even been suggested

that the United States negotiate a treaty with Hollywood film makers to lessen the damage done by the content of their movies in other countries.[5]

FACT: For thousands of years, the average man traveled 30,000 miles during his life-time.[6] Today, the average man travels 3 million miles. "More Americans are traveling abroad today than there were people in the United States when it was founded."[7]

FACT: "A transistorized electronic computer can--in one minute--print out the solution to a problem that a decade ago would have taken two years to solve if every educated person on Earth worked full time on the calculation."[8]

FACT: "Between now and the end of the century, the U. S. will have to build as many structures as it has built from Colonial times to the present . . . . To maintain decent housing standards, we need to build 2.6 million new single family dwellings each year for the next ten years."[9]

FACT: "Gifted deaf subjects have . . . experienced thought transfer over distances approaching 200 miles . . . . In another experiment, a doctor successfully transmitted Morse code by controlled brain waves alone. The phenomenon, capable of activating a computer, demonstrated the 'sending' ability of the brain."[10]

FACT: Through the use of his eleven physical senses, man is able to directly detect less than one-millionth of the total physical world now known to exist.[11]

FACT: Two lines, equidistant apart, extended indefinitely are said to be parallel and therefore never meet. This has been shown to be false--parallel lines do meet.[12] Experimentation has invalidated the majority of mathematical axioms still being taught in our schools everywhere.[13]

FACTS: A study of trends, reported a number of years ago by Mort and Cornell, concluded that "it required from 75 to 100 years for an educational idea or theory to be translated into common practice."[14]

Consider, for example, the problem of a new student entering college next term. If the student wants to teach first grade, then our problem is that we have to teach the student how to teach children who, if born in 1972, will not even leave school until at least 1993, and who will have to live two-thirds of their lives beyond the year 2000![15] Teacher education programs must clearly be oriented toward the future.

Vast amounts of time and energy and money, however, are being spent to prepare our students for a world that no longer exists.

The winds of change are sweeping the world, and the rate of change is such that a human being with an average life span will have to learn to face novel situations which find no parallel in his past. "The fixed person

for the fixed duties, who in older societies was such a godsend, in the future will be a public danger."[16]

"We know that the biosphere is limited, and that we can paint ourselves into a corner if we aren't careful of the dimensions of the room we are in. Pollution and population problems are like a giant ship coming into port. To stop such a ship from ramming the pier, the order to back engines has to be made early in the ship's approach. It cannot be done at the last moment."[17] Our future welfare depends on foresight. Environmental problems are just a hearbeat away from each of us.

What we need to clean up the environment is a big kidney--but the problem is that we don't have a kidney. To many environmental problems, there are existing solutions--but they are not being applied. It's not as easy to solve problems as one may think. Malnutrition, for example, is one problem that doesn't have to exist at all. The world currently produces over three times the total protein and calorie needs of its total population.[18] The technology and resources to eradicate malnutrition completely currently exists.[19] What seems to be missing is the desire.

It is not timely to submit a proposed state plan for environmental education--it's far overdue. It's not that we can't solve a great many of our environmental problems--it's just that we can't seem to organize ourselves to put into effect what we do know. Pogo was correct--we HAVE found the enemy--and it is us. Society's slow response to the hazards of not implementing plans for educational change, can be viewed in terms of "cultural lag." Cultural lag, a term first used by William Ogburn in 1914, is what happens when a maladjustment develops between two previously adjusted parts of a system.[20] Schools and other institutions were once well adjusted to the demands of the environment. For example, the school year lasted only nine months--September to June-- so children could provide the needed labor at harvest time. Also, the schools dismissed the children at about 3:00 p.m. so they could complete their chores on the farm before nightfall. Even though the chores are gone, and the harvest mechanized we continue to act as if children were still living in an early rural society. The time gap between what and how we teach, and what children will need in order to function tomorrow may be viewed as a cultural lag.

One task of the environmental sciences is to reduce the cultural lag and to improve our ability to foresee and plan for environmental changes harmful to the well-being of our families. Scientifically we can foresee much. For example, we can foresee and prevent air and water pollution, but we don't to the extent needed. We just can't seem to bridge the people barriers to do so. People can't seem to understand the nature and magnitude of the problem yet. I'm reminded of a person trying to stop smoking--sometimes I think the healthiest thing he could have would be just a touch of cancer.

The ability of your students, or your own children, to solve environmental problems may be of manifold more importance to them, than to you. The ability of your students to solve local problems today give us insight into the probability of their being able to solve bigger problems tomorrow.

Each of you will be called upon to make adaptive decisions now, anticipating their "pay-off value" in the not-so-far future. Such adoptions have been called "anticipatory innovation-decisions" by Everett Rogers of Michigan State.[21]

MAKING ANTICIPATORY DECISIONS

The message to follow is bold. It deals with such anticipatory decisions. And it deals with the introduction of a choice, a choice of whether to live in harmony with the script of reality or in conflict with the way the biophysical world works.

The central theme woven throughout the fabric of the proposed state plan is that man does not naturally develop beliefs that necessarily lead to environmental degradation. On the contrary, research says that such beliefs are learned--and are therefore subject to change.[22] The state plan reads the directives of our times, closing deadly cultural lags, and suggests a path of systematic and planned change. By "planned change" we mean purposefully and skillfully deciding what we are going to do about problems rather than leaving their solution to chance.[23] For example, it is kind of like a medical doctor purposefully and skillfully deciding the medicine you need. You wouldn't want him to give you just any-old medicine that came to his mind would you? The risk may be high so he doesn't take chances. The state plan reduces risk by offering a choice. The decision to take such a path rightfully belongs to each citizen of Michigan. But, of course, you can only choose alternatives of which you are aware. And not to choose is in itself a choice. Decision-making, therefore, cannot be avoided. "Like the donkey who starved to death between two bales of hay, unable to make up his mind which one to eat, we, too, are poised in our times between the reverence of the past and the acceptance of the future we see glittering there before us."[24]

"Conscious planning, based on the ability to integrate accumulated knowledge of the past with reasoned, anticipated outcomes in the future, is the distinctive mark of the human animal."[25] The wise explorer, for example, studies the maps of those who went before, but he also skillfully ponders the journey yet to be traveled. One should not be committed more to the past, however, than the future, unless one decides to go that way.

Governor Milliken's "Program Policy Guidelines" for the fiscal year 1973-74 have stated the following: "an essential component of responsive decision-making is a planning capability. Planning must focus its energy on describing the nature of the society we want to build, identifying the complex problems that must be resolved in order to get there, and searching for alternative means for achieving societal goals." Governor Milliken said, in short, that "we must begin to look systematically into the future or we will forever group with the crises of the moment."[26]

CRISES ORIENTATION TO PROBLEM-SOLVING

There seems to be little doubt that we are a "crises-oriented" society. We seem to act individually and collectively only under the axe of danger. We are crises-oriented, and, as Stewart Udall so aptly put it, we'll inadvertently overlook the signs around us until they "lay across the nation's path like a fallen tree."[27] Rene Dubos reminds us, for example, that the construction of great dams throughout the world has been prompted not by a comprehensive, systematic plan of wise land and water use but by the crises of floods and shortages of safe water. Only after the dust bowls in the 1920's and 1930's did we activate plans to control soil erosion. Citizens are just now becoming aware of the dangers and educational implications arising from undisciplined technology, consumption, and population growth. For example, the ugliness of parts of our cities is now generating concern for esthetic improvement. But as Rene Dubos further points out, "The scandal of the living conditions in the slums of large cities entered public consciousness only under the pressure of race riots. However, awareness of these problems does not seem sufficient to generate really effective control policies."[28]

What is commonly called "environmental problem-solving" is often only the application of cosmetics to visible blemishes.

Just a few years ago, for example, in one of the busiest airports in the world, a group of concerned citizens complained about the black smoke trailing behind jetliners. The airline companies volunteered to clean-up the pollution before public pressure forced new government control. What the airlines did was to put afterburners on their jets.

An afterburner, in simple terms, takes the smoke, which is made up of particles large enough to be seen by the unaided eye, and ignites it a second time. This reduces the particles to about one-tenth their original size and creates some new kinds of gases--heaven knows the long-term effects of these new gases on our health. The particles are now so small they can't be seen. However, the new-sized particles are not kept aboard the plane, as many people would like to believe.[29] They are still dumped into our tissue-thin envelope of air.

The concerned citizens looked out their windows and praised the airlines for their excellent clean-up job. Little did they know that, at about the same time, a large university demonstrated that there was an almost direct correlation between the size of particle and where it tended to be caught in your throat.[30] The big particles--the visible ones-- tended to catch in the upper parts of your throat. You can tell they are there by the soreness. You might think you just have a cold because in the past sore throats and colds were associated. In the future we will begin to think more in terms of pollution problems--that is, if we can generate sufficient educational programs.

The invisible particles, on the other hand, tended to settle on the alveolar sacs deep in the lungs. The effects of these small invisible particles can, in many cases, only be measured over time--unless of course you already have a respiratory problem like many of our senior citizens.

My point is this: unless we have comprehensive educational programs for citizen groups and schools alike, we will continue to handle such pollution problems in a cosmetic fashion. In the case of the afterburner, the decision was actually anti-environmental. Environmental problems, to be sure, are very complex, and taking them out of visible sight only intensifies the most critical problems.

We have to attack complex problems from many angles. In our airline example, one might permit fewer flights. Airlines, like most industries, wastefully compete for the private profit at the expense of the health of almost everyone. There are, for instance, something like 10,000 empty seats each day on commercial flights alone from Chicago to New York![31]

Many of you are from Detroit. Last April William Ruchelshaus, Administrator of the Federal Environmental Protection Agency, presented a short description of the problems of your city. He said, "In defiance of laws, international treaties, and the rights of other communities to live and prosper the city of Detroit has for many years sent a constant torrent of human and industrial filth into the Detroit River and Lake Erie. Time and time again reports from engineers, commissions and governmental forces, all sounding the danger cry, have been received by the Detroit fathers, and have been tabled. Prospects are evident . . . that 20 years from now will see Detroit still making a wallowing trough of the Great Lakes."[32] Ruchelshaus said that alright, but he was reading directly from a back issue of the Chicago Tribune--published in 1926!

There is something disturbingly insane about a society that pays attention to plans vital to its long-range survival only when some potential catastrophe or imminent threat of trouble frightens it into doing so.[33] We humans are losing our margin of error. Many of our schools have already lost their margin of error. We cannot make any more big mistakes. Mass environmental pollution and the long-term efforts of early conservation educators have provided the starting blocks for a new movement--Environmental Education.

THE PLANNING OF CHANGE

The intents of planned change for environmental education are to make everyone knowledgeable about their surroundings and to help them effectively use this environmental knowledge to make their neighborhood, state, and world a healthier place. Moreover, planned change creates within each person a motivating desire and commitment to protect and enhance the environment through responsible citizen action.[34] Environmental education is a voyage with a clear destination, and it must be well charted. A state plan is such a chart.

FUNCTIONS OF A STATE PLAN FOR EE

What exactly does the state plan do?[35] The plan answers four basic questions:

(1) What is important to us?--that is, it includes a statement of

the author's beliefs.

(2) Where are we now, and where do we want to go?--it assesses current efforts and defines goals.

(3) How shall we get there?--it develops the means for arriving at goals.

And, (4) how shall we know when we have arrived at our destinations, at our goals?--it designs evaluative systems.

Good planning has two main features:[36] it's comprehensive--that is, it encompasses both formal and non-formal educational programs; and it's long-ranged--it's futuristic. On the whole, educational planning, whether on the national, state, or local levels, has clearly been a 19th Century vintage. Environmental education planning has been no exception.

To be sure, there are many paths to environmental literacy. We must, however, be wise enough to catch the nearest wave. And to have a plan the best available expertise must be brought into the environmental education picture. This expertise must be placed on the cutting edge of all of our planning efforts. In the development of the state plan for Michigan, the best available expertise was tapped. One hundred four professional consultants, for example, have been asked to comment on the draft of the plan.

Although no sane man would begin to build a modern house without a plan, we have been trying to build an environmentally-oriented nation for years without even the sketchiest plan. No wonder we still have some programs wherein all they do is distribute a few isolated facts about pollution. Since facts are in constant change, they alone are almost inconsequential. Facts trickle through the scientist's hands like water. Fact today, myth tomorrow.

It might help clear the air to indicate in a more specific sense what I mean by "Planning." Donald Michael gives a lucid explanation. He said, "I do not mean by 'planning' the all too frequent exercise of simply drawing up a set of diagrams and recommendations for what a particular situation should be like five or twenty years from now. These impressive documents almost always end up filed away and, if used at all, they merely serve as rhetorical, almost ritualistic, props for other purposes."[37] Planning, as Michael envisions it and as it is referred to here, does include such diagrams and recommendations, but it also entails the development and use of the means for attaining the recommended ends.[38] Michael goes on to say that the purposes of long-range planning are (1) to anticipate our critical problems and opportunities, (2) to assign to them social priorities,[39] and then (3) to husband our resources in order to meet them.

"Science has begun to shift from the measurement of things to the study of process and the interactions between them; the 'proper study of mankind' is not longer man, but change."[40] Unfortunately, the systems concept--upon which the state plan for Michigan is based--has moved very

slowly into educational planning. A long-range perspective exists only in scattered rhetoric.

A system is essentially an arena in which all happenings are viewed as interchanges of information up and down, and in and out of various structures. A system is never static. It is a process. The process is programmed by its participants to serve their needs, individually and collectively.

Projection into the future is at the heart of Michigan's planning process, yet it is the requirement most difficult to include. For example, short-range economic pressures of environmental education needs often lead to short-term economies that are diseconomies from a long-term view.[41]

"Planning can be expected to avoid problems rather than solve them, first by applying existing knowledge . . . and second by anticipating future needs and conditions."[42] The state plan for Michigan is therefore anticipatory. It looks ahead. We didn't drive into the future by looking only through the rear-view mirror. It's hard to see obstacles that way. Winston Churchill siad it well. He said, "Past experience carries with its advantage the drawback that things never happen the same way again."[43]

The state plan for Michigan doesn't recommend to anyone that they move things around--such as build a building, plant a tree, or rotate office titles. The plan deals with the means, the processes, that get individuals and organizations to begin observing the directions and implications of the way they function and what the products of such functions mean to the near, middle, and far futures. The plan sets up the machinery and channels the flow of information to deal with people problems. The plan aims to pull people together to look at, and continually monitor, our behavior toward the environment and then make suggestions on how to make educational decisions sensitive to environmental changes.

PLANNING IS A LEARNING PROCESS

Planning is essentially a learning process because we do not know for sure what the future holds.[44] Changes in our environment are like moving targets, you see, so our bow and arrow must be continually re-aimed. In sum, getting people together to look at themselves and others is what the Michigan plan is all about. If we can do that, then most other problems should take care of themselves.

Besides providing long-range direction and coordinating various approaches to environmental education, the plan also makes available to any individual, citizen group, or institution federal funds allocated under the Environmental Education Act of 1970. Future requests for money from the Act are to be consistent with the official state plan.

EE STATE PLANS AFFECT EVERYONE

Who is involved or affected by the state plan? Planning efforts are aimed at important segments and individual citizens of Michigan. Since environmental education is broad and comprehensive, literally no individual or group is excluded. The plan has an intersecting interest in all fields.

If we approach environmental education as the educational process belonging only to the public schools, then we're back in the 19th Century again. Society operates as a whole system of interdependent parts, as an organic whole--a gestalt. It is not wise to date our awareness of how the world works back to the 19th Century.

The major groups having specified responsiblities include citizen organizations, elementary and secondary education, higher education, youth groups, church groups, business and industry, agriculture, organized labor, state agencies, mass media, all levels of government, trade associations, and professional organizations such as the Michigan Environmental Education Association.

Although each group is highly important, I want to emphasize the importance of a couple of groups. We often omit pre-school people. There are 20 million people in the United States under five years of age![45] And research tells us that basic attitudes are cemented into children during these formative years.[46] Young children absorb information at phenomenal rates. The average 4-year old child asks four hundred questions a day, reports Wendall Johnson.[47] From research, we also know that 80% of our young children are already politically aligned by the time they are in the 3rd grade![48] As mentioned earlier, most of these children's lives will be spent beyond the year 2000. What do we teach them that will be relevant for 2000 and beyond?

We tend, you see, to treat young children as if they were going to be adults in our world. A definition of the word "sweater" puts my point across: A "sweater" is something a small boy puts on when his mother gets cold.

Another absolutely essential part of a state plan concerns mass communications. The facts are again shocking. (It has been said that all the world is watching the United States, and all the United States is watching television.) "On the average, television in our lives is watched 5 1/2 hours per day. Before entering school, children will have spent 3,000-4,000 hours in front of a television."[49] You can estimate yourself how many commercials he's seen. Commercials are shaping attitudes; they are shaping our perceptions; they are affecting our entire sensory profile. The average television commercial is produced at $35,000 per minute. Contrast that with the average production cost of an educational film. It cost on the average $1,000 per minute.[50]

The menu on television commercials today is not only one product versus another, but also the push for high consumption of resources. Most commercials are for products. All programs are also for products. George

Burns sells cigars. Dean Martin sells cigarettes. Life of Riley sells carpets, dresses, T-V sets, soft drinks, and lunch pails.

Before a person finishes high school he will probably have spent 15,000 hours in front of television compared with 10,000 hours spent in formal schooling.[51] By the time he graduates from college, he would have spent more time watching television alone than total hours in school. It would be absurd to ignore the mass media in a state plan for environmental education.

Another key component of the state plan relates directly to youth. It's hard to really define what age group will be catalogued as youth in the future. We tend to place the cut-off point at 21 years of age, or more recently, 18. The age of 21 dribbled down to us from the 15th Century. In that relatively low-protein society, it was 21 years before a male was strong enough to put on armor and fight with sword in hand. Thus, he became an adult. Oddly enough, for our society 21 became the age of adulthood and until recently the right to vote.[52]

Youth have an acute ability to sense change; hence, thay can't understand age old fixations jacketing them. Almost every direction they turn, they are confronted with yesterday's fiction operating as today's fact--atomic submarines, lasers, space travel, ESP. "As of now, 50 percent of the population in the emerging world is under 15 years old. By 1975, the population in the emerging world under 15 years old will equal the total population of the developed world."[53] Key your eye on this group.

THE DEVELOPMENT OF MICHIGAN'S PLAN

How was the State Plan developed? In mid 1971 various individuals from citizen and government organizations met and subsequently recommended to Governor Milliken that a State Plan be developed. They also suggested why it was so urgently needed. The Governor, responsive to the needs and recommendations, appointed a broad-based task force to write a plan. Task Force members represented education at various levels, labor, business and industry, state agencies, students, Michigan Education Association, Michigan Environmental Education Association, etc. They also represented the state geographically. In order to obtain the necessary funds to write the plan in a manner that most nearly reflected the needs of all citizens, the Task Force submitted a request for funding under the federal Environmental Education Act. The Task Force subsequently received a grant from the federal government.

Believing that broad citizen involvement during all phases of the planning process is essential, the Task Force began their efforts by mailing 600 questionnaires to a cross-section of Michigan citizens. The cross-section represented all of the state's segments mentioned earlier. With the input of the returned questionnaires, the Task Force sponsored a series of regional meetings throughout the state. Four meetings, oper to everyone, were held in the major geographical regions of the state.

The regional meetings were especially important because different regions of the state are experiencing both common and unique environmental problems. Southern Michigan is characterized by ballooning suburbs and industrial encroachment on open space and prime farmland around urban and suburban districts. The inner-city areas are suffering from over-crowding and other degrading conditions. When people are packed into a city, problems intensify, in much the same way that if a gas is pumped into a bottle, the number of collisions among the atoms sharply increases.

Throughout history the concept of what a city is has drastically changed. The great city of Sparta, for example, only had 5,000 people within its walls.[54] Today, some high schools are of that size. Cities export problems, just as all environments do. Michigan's upper peninsula is experiencing heavy recreation pressures, the environmental pressures of the growing wood-using industry, some dying towns, and a general out-migration of people. Because problems in one region affect other regions, it is important to consider the problems, including educational problems, of each area as the concern and responsibility of all segments of society.

The Task Force's regional meetings were designed to give individuals and groups maximum opportunity to be heard. The meetings were essentially small group discussions during which each individual could react to tentative goals and subgoals which the Task Force had generated earlier from the information provided by the mailed questionnaires. The opportunity was also provided for individuals and groups to make specific and detailed recommendations on <u>how</u> to achieve the tentative goals and subgoals.

All contributions from the four regional meetings were progressively brought forth to a day-long statewide conference held in Lansing last July (1972). Drafts of major portions of the plan were evaluated at the conference and further recommendations were offered by individuals and groups.

The Task Force then drafted another copy. This draft was then mailed to a list of professional consultants and made available for all citizens of Michigan to review. Everyone who attended any of the Task Force's meetings or who corresponded with them, or who appeared on any one of a number of environmental education directories in the state was personally mailed notification that the draft was ready for review.

Within the next few weeks the Task Force will be finalizing the first edition of the recommended plan and submitting it to the Governor for his approval.

A major point to stress is that the document we will be producing is only the <u>first</u> edition of the state plan. Probably an equally important edition will be published in about five years. At that time, this year's plan will be up-dated and made to reflect new data. "Planning never stops: it is always dependent on evaluations of how things are going according to plan and how things are going outside of the plan, and it is always responsive to the ongoing evaluation of the degree of mesh between the two."[55]

ESSENTIAL ELEMENTS OF EE

How does the Task Force define environmental education? What does it involve? Environmental education, in simple terms, is the fundamental educational process dealing with man's relationship with various surroundings--whether man-made or natural, rural or urban. I personally define it in the following way: "Environmental education is the process of recognizing and clarifying the values, attitudes, and concepts necessary to understand and appreciate the interrelatedness among man, his culture, and his biophysical environment. Environmental education, moreover, entails practice in decision making about issues concerning environmental quality."[56]

The process is not confined to "formal" educational systems such as elementary or secondary schools, but also includes "non-formal" education such as occurs through radio, television, the press, industrial bulletins, professional journals, newsletters, advertising, and personal example.

Although related in important ways, environmental education should not be considered synonymous with such terms as "conservation education," "resource-use education," "science education," or "nature study." Each of these fields shares common elements but differs in emphasis and history. Each is entirely justified in itself as making important contributions to society, and each has important contributions to make to the comprehensive concept of environmental education.

It is sufficient to say that environmental education emphasizes problem-solving techniques aimed at real problems in the local community as they are felt today or are anticipated in the future.

It has been said that some form of environmental education has been around for at least 70 years.[57] This is probably true. But even though some working parts of, say, an automobile were around before Henry Ford put them together, it was only the assemblage and interaction of all the essential parts that made it go anywhere. Only when all elements of environmental education are operating in concert do we truly have an effective concept. Just as an automobile axle standing alone cannot be properly labeled "automobile", an element or two of environmental education standing alone cannot properly be labeled environmental education. If we are to label a program environmental education, let's go full circle and include all of its elements. Donkey-tail labeling only creates public confusion and retards the achievement of important goals.

It is interesting to note that in 1941 the Michigan State Superintendent of Public Instruction made the following comment in an open letter to all Michigan teachers: "It is not enough that they [the students] learn the facts of conservation; they must engage in useful activities in which the facts become operative."[58] This statement emphasizes an important element of environmental education. Since environmental facts cannot be frozen, environmental education cannot only impart information. It should concentrate in developing abilities to find and use knowledge. To find it, of course, you must know what your subject matter is; that is, you must

know what questions to ask. When the right battle ground has been found, the mounting of the guns is easier.

Since environmental education is interdisciplinary, it doesn't fit the traditional subject matter mold so popular in many schools. Its content is drawn from all fields--such as the humanities, social sciences, economics, psychology, the biological and physical sciences. To ask what part of the curriculum is environmental education, is to ask which word is the dictionary.

Since environmental education is a process, it involves learning how to be effective in solving the full range of environmental problems. If you give a man a fish, he will eat for a day; if you teach him how to fish, he will eat for a life-time, even beyond the year 2000. Environmental education is total and comprehensive in its use of "know-how" and in the application of this skill to contemporary problems.

What is another essential element of environmental education? Ecologists have been watching the overall health of both our urban and rural environments for a number of years. According to their observations, there are clear symptoms of unhealthy conditions. Based upon experience and training in environmental matters, a preliminary diagnosis has been made by environmental educators, and a temporary presecription has been offered in the form of a state plan to curb the potential deadly effects of destroying the healthy life-support systems that sustain us.

It's interesting to note that the idea of preventive measures or preventive medicine is not really new. It's been a part of oriental life for centuries. An oriental doctor, for example, was paid by the patient when he was healthy; payments ceased when the patient became sick. The doctor provided medical treatment as needed during illness free of charge.[59] Somehow it seems backwards in our country; our system seems to be reinforcing the wrong end of the problem. It is a medical doctor's economic advantage to have an unhealthy population and his economic disadvantage to have the masses healthy. Strange.

Nevertheless, based on an environmental diagnosis, an educational prescription can be proposed and tested. The prescription, written as a state long-range plan, does not aim to bandaid the visible surface wounds, but attempts to cure the underlying causes of the problem. Treating the symptoms is like holding down the lid of a pot which has over-boiled instead of turning off the fire underneath.

Michigan's State Plan for Environmental Education exposes each citizen to this written alternative and, therefore, offers people an increase in the number of choices in the way they want to live. Certain choices can only be made when an individual becomes aware of the implications of perticular life-styles. Many of these life-styles have not been adjusted to prevent the long-term harmful consequences of many learned habits.

The most appropriate theory concerning the genesis of voluntary behavior indicates that man behaves according to his beliefs.[60] Early

man, for example, avoided certain places because he believed them to be occupied by demons. He also avoided sailing far out to sea because he believed the world was flat and that he would eventually sail off the edge. Man did not behave according to realities, but instead he performed according to what he believed.

Even though ecologists have learned much about how living systems work, the behavior patterns of our culture persistently mirror an environmental belief system that is in conflict with realities. As long as our beliefs produce living styles in conflict with the maintenance of a healthy environment, we will have increasingly severe environmental problems. Cultural mores are important, but may be readily overshowed by environmental forces. "Most groups elaborate certain aspects of their cultures far beyond maximal relative utility or survival value," reports Kluckhohn and Kelly, "at times, indeed, this does exactly the opposite."[61]

Since environmental education involves the recognition and clarification of the beliefs and attitudes that form environmentally sound values, an essential element of environmental education is the personal negotiation of values. Thus, environmental education aims at the core of man's culture--his beliefs about himself and his world. The entire cultural system--which includes all social, economic, political, religious, scientific, and education institutions--is the lens through which man views his environment and provides the goods and services he perceives he needs.

KEY RECOMMENDATIONS OF MICHIGAN'S PLAN

What are the key recommendations of the state plan for Michigan? In all, the plan carries 96 specific recommendations. Many of these recommendations must necessarily be achieved at different points in time. They will be strung along like a row of buoys to mark the channel that leads to environmental education goals. These recommendations serve as markers to make it possible to avoid the rocky shores of directionless action. Some recommendations are aimed directly at specific groups while others are aimed at all groups.

Two key recommendations, relevant to everyone, are (1) that a statewide Environmental Education Council be established in the Governor's Office and (2) that a Citizens Advisory Board be appointed to work with that Council. The statewide Council would be a policy making authority. The Council would be comprised of seven members, including the head of the Department of Education, and a majority of citizens-at-large, to be appointed by the Governor.

The Advisory Board would be comprised entirely of citizens, appointed by the Governor, who would represent the state geographically and represent the main segments of society. The purpose of this high level coordination would be to bring data and broad decision-making into one central place and to maintain a continual analysis on the effectiveness of planning efforts.

A NECESSARY ROLE OF GOVERNMENT

Whose responsibility is environmental education? It would be irresponsible for government to deal with the various "means" of achieving societal goals while neglecting the more important societal "ends." Societal "ends" are goals that relate directly to the quality of life. Societal "means" are governmental programs that do not necessarily ensure the quality of life. Improved roads and highways, for example, are "means" and therefore do not in themselves imply desirable societal goals, for even non-democratic nations can have good highways.

Environmental education is a central and mandatory function of government because it aims directly at the "ends" of society rather than at the less significant "means" only. Environmental education is aimed at maintaining or raising the qualities of life.

Although environmental education is essential to the quality of the future and therefore the preservation of a democracy, and after months of wandering through state-level agencies, I have found only two people among over 53,000 state employees who I believe have the required philosophy, professional preparation, and personal motivation and commitment to be labeled, by all professional standards, an "environmental educator." To the surprise of many, neither of these two individuals are employed by the State Department of Education.

Formal educational systems alone will directly affect over 50% of our population during the next decade.[62] Yet, for all of our rhetoric about the future, many schools face backward.

It seems logical that each decade tends to ignore a significant problem. In the fifties, we ignored the race problem--though all the symptoms were there. Then race riots exploded in the sixties. Then, in the sixties, we ignored environmental problems, though all the symptoms were again there. In the seventies, the environmental problem exploded. Now, in the seventies, I predict the problem we are ignoring is that of formal education--yet, all the symptoms are about us. The environmental oversight in the public schools is one of the largest symptoms. If we don't solve this problem during this decade, we are sure to see it explode before 1985.

We must begin to tool up for these problems now. We must look to the future. True, a great many schools say they have environmental education programs. Often, such programs are of a very limited nature. You can't expect to change human behavior by exposing students--or any citizen, for that matter--to environmental concepts once or twice a year. Likewise, you can't learn to play the piano by visiting it once or twice a year. For something to be a part of normal functioning, you must be confronted with it repeatedly, time after time, in a diversity of situations.

Although we have known for a long time that the accumulation of facts alone does little to solve real problems, such handing out of environmental tid-bits seems <u>still</u> to be in style. But change takes time and we must be patient, but persistent. Even the Corps of Engineers needs

time. For example, the average time for them from project initiation to completion is 19 years.[63]

Another example of the problems our culture has in responding to much needed programs, would be in the housing area. "The 'standard' single family dwelling in the U. S. takes from six weeks to two months to complete. Its exact equivalent can be factory prefabricated, trucked to the site and erected, ready for occupancy, in 18 hours, at half the labor and materials cost."[64] Why don't we do it then? Because we can't organize ourselves to put into effect even what we do know.

ALIGNING INSTITUTIONAL PRIORITIES

While a simple constraint to beginning environmental education programs--whether on the national, state, or local level, could be listed as funding, one of the real reasons behind why money is not available can be found in problems related to priorities. Often, lack of funds is a major constraint only on the surface. Misarranged priorities and the lack of knowledge--they go together, hand and glove--are the basic obstacles to the implementation of plans.

While our world and its people are coughing along in hopes of attaining their aspirations, certain goals have been deferred until others are met. Our misarragnement of priorities is so absurdly overwhelming that they almost defy conceptualization. For example, the cost of one new prototype bomber, fully equipped, would pay for 250,000 teacher salaries for one year; or, it would pay for 30 science facilities, each with 1,000 students.[65] Or, more overwhelming yet, the cost of 14 standard jet bombers would pay for a school lunch program serving 14 million children![66] "The world spends $100 a year," on the average, "to teach a child how to read and a little later on in his life, $7,800 a year to teach him how to shoot."[67] Every 30 hours, the war uses up the equivalent of the Peace Corp's annual budget![68]

My point in such illustrations is to flag my personal conviction that we can have environmental education programs the very moment we begin to care enough. Financial constraints seem to cluster around priorities rather than the lack of expendable dollars. "There is something patently insane," Buckminster Fuller reminds us, "about all the typewriters sleeping with the beautiful plumbing in the beautiful office buildings--and all the people sleeping in the slums."[69]

Each of you who cares enough must become an activist. It is true that when men of action agree, obstacles disappear. Each of us--alone and in concert--muat be an environmental education activist, in the most responsible denotation of the term. You have to make yourself heard. You have to get your messages across to those who are making decisions. It's not an overstatement that it's the squeaky wheel that gets the oil. And to be a squeaky wheel you have to get latered-up about our concerns, and then become actors instead of spectators.

Soon Michigan's state planning document will be taken over by events, and the events will follow their own course. We must work to design those first few events. But make no small plans; they have no magic to stir men's enthusiasm--and probably will not be realized. Make big plans; aim high and hope, remembering that an ambitious as well as a logical plan for any endeavor, once recorded, will never die, but, long after we are gone will be a living document, asserting itself with ever-growing insistency. The time is right to reach for our potential and I'm optimistic that we'll eventually attain our goals.

In closing, I have been asked to read to you this telegram which was an emergency dispatch from the Capitol in Waskington to the Governor's Office just a few short hours ago. It reads, "after years of intensive study, scientists have finally discovered what they believe to be the missing link between the anthropoid apes and civilized man--it is us!"

FOOTNOTES

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[10]Missiles and Rockets and The Financial Post, quoted in Fabun, Dimensions of Change, p. 23.

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[18]H. A. B. Parpia, Ceres, Vol.2, No. 5 (September-October, 1969). Published by the Food and Agriculture Organization of the United Nations.

[19]Fabun, Dimensions of Change p. 122.

[20]William F. Ogburn, "Cultural Lag As Theory," Sociology and Social Research, Vol. 41 (January-February, 1957), pp. 167-74; also see Muriel Crosby, "Who Changes the Curriculum and How?" Phi Delta Kappan (March, 1970), p. 385.

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[66]McHale, p. 89

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